

REMARKS/ARGUMENTS

This is responsive to the final Office Action dated March 3, 2003.

Allowable Claims

The Examiner found allowable subject matter in claims 41, 42, 45 and 46. Claims 45 and 46 are being made independent. All of these claims are therefore allowable.

Claims 43 and 44 were rejected under 35 U.S.C. §112, paragraph 2. A minor informality is being corrected without changing the scope of the claims. These claims depend from allowed claim 42.

Allowance of claims 41-46 is therefore requested.

Prior Art Rejections

Claims 29-33 and 36-40 were rejected over Cogan et al. in view of Floyd et al. and Harada. Claims 34-35 were rejected over the foregoing references, and further in view of Bulucea et al.

Claim 39 is being rewritten in independent form without changing its scope. Claims 29, 36-38 and 40 are being canceled. Claims 30-35 now depend directly or indirectly from independent claim 39. Reconsideration and allowance of claims 30-35 and 39 are requested.

As amended, claim 39 recites a MOS-gated semiconductor device:

wherein the thickness of said gate dielectric is chosen to optimize resistance to high radiation effects and wherein the thickness of said bottom dielectric is chosen to optimize resistance to SEE;

wherein said gate dielectric has a thickness which is less than 900 Å; and

wherein the thickness of said bottom dielectric is greater than about 1300 Å.

The bottom dielectric which is at least about 1300 Å thick is optimized for SEE resistance, while the gate dielectric which is less than 900 Å thick is optimized for radiation resistance.

The Examiner noted that Cogan (Fig. 2) has a gate dielectric region 112b with a thickness of 100-2500 angstroms, which includes the 900 Å figure; and a bottom dielectric region 112a with a thickness of 500-5000 Å, which includes the 1300 Å figure.

However, despite these disclosures, the prior art does not suggest the claimed invention, and actually teaches away from it.

The invention of claim 39 is that the gate dielectric must have a side thickness less than 900 Å and a bottom thickness over about 1300 Å, to optimize resistance to two specific hazards. Cogan does not teach this. Cogan teaches that the side thickness and bottom thickness shall have values selected anywhere within the ranges of 100-2500 Å and 500-5000 Å, respectively. Following this teaching would have little chance of realizing a device that is optimized for both radiation resistance and SEE resistance.

Following the teachings of Cogan, an appropriate side thickness is 1000 Å and an appropriate bottom thickness is 1000 Å. Neither of these values would realize the invention of claim 39, and the device would not be optimized for both radiation and SEE resistance.

Cogan teaches that side and bottom thicknesses of 1000 Å may be combined. According to claim 39, these values must not be combined.

Moreover, Cogan teaches that the side dielectric must be no thinner than 100 Å. This teaches away from claim 39, which has no lower limit. And Cogan teaches that the bottom dielectric must be no thicker than 5000 Å, while claim 39 has no upper limit for the thickness.

The Office Action has not examined the invention as a whole. Panduit Corp. v. Dennison Mfg. Co., 227 U.S.P.Q. 337 (Fed.Cir. 1985), remanded, 229 U.S.P.Q. 478 (U.S. 1986). It is erroneous to focus one-by-one on differences between specific features of claim 39 and the prior art. Such differences may be slight and yet may constitute the key to the success of the invention as a whole. Datascope Corp. v. SMEC, Inc., 227 U.S.P.Q. 838 (Fed. Cir. 1985).

Cogan had no awareness of how to optimize either SEE resistance or radiation resistance, much less how to optimize both effects simultaneously. An invention may be claimed according to its functions and the results it accomplishes. MPEP §2173.05(g). If the claimed function is new, the claim should be allowed. Rohm & Haas Co., v. Dawson Chemical Co., Inc., 217 U.S.P.Q. 515, 563 (S.D. Tex. 1983), rev'd on other grounds, 220 U.S.P.Q. 289 (Fed. Cir.

1983); In re Swinehart, 169 U.S.P.Q. 226 (CCPA 1971). Many embodiments of the Cogan invention would not have the features of radiation and SEE resistance recited in claim 39. A skilled person reading Cogan would not have any idea that the side and bottom dielectrics should be in the respective thickness ranges.

The structure of the gate in Cogan was designed to avoid field-induced breakdown. Col. 1, line 48 to col. 2, line 12. For this purpose, the 100-2500 Å and 500-5000 Å ranges were found desirable.

The prior art contains no motivation to modify Cogan's ranges. As for the side dielectric thickness, the Office Action changes Cogan's upper limit from 2500 Å to 900 Å. The Office Action disregards Cogan's lower limit of 100 Å. As for the bottom thickness, the Office Action raises Cogan's lower limit from 500 Å to 1300 Å. The Office Action disregards Cogan's upper limit of 5000 Å. The Office Action points out no motivation in the art for these changes. There is none. Cogan was concerned with field-induced breakdown. Cogan teaches nothing about how to respond to SEE or radiation, which was the motivation for selecting the ranges recited in claim 39.

Although there may be some overlap between the Cogan disclosures and the ranges recited in claim 39, patentability is shown at least by the unexpected results obtained by the invention, explicitly recited in claim 39 and not suggested by Cogan or the other art. In re Peterson, No. 02-1129 (Fed. Cir. 1/8/03); In re Geisler, 116 F.3d 1465, 1469, 43 U.S.P.Q. 2d 1362, 1365 (Fed. Cir. 1997).

In summary, the cited art, including Cogan, neither discloses nor suggests the invention of claim 39. The art contains no motivation to modify the ranges in Cogan so as to obtain a structure as defined in claim 39, nor does it suggest the advantages and effects that the invention accomplishes.

For at least these reasons, reconsideration and allowance of claims 39 and 30-35 is requested.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231, on June 2, 2003:

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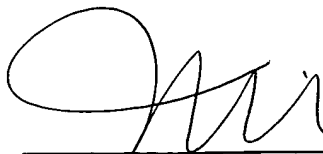
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